Determining the Index of Refraction
Lesson Notes

Learning Outcomes

- How do you analyze the path of light through a material in order to determine the index of refraction value of the material?
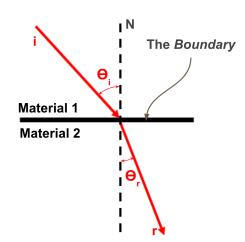
Snell's Law … Revisited

Snell's law describes the mathematical relationship between the angles of incidence and refraction for light crossing a boundary.

$$n_i \cdot Sin\Theta_i = n_r \cdot Sin\Theta_r$$

n_i = index of refraction of the incident material
n_r = index of refraction of the incident material
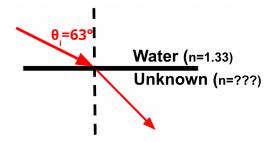Θ_i = angle of incidence (angle between i and N)
Θ_r = angle of incidence (angle between r and N)

The video tutorial presents four problems with their solutions. Watch the video, show your own solutions to the problems below, and trace the path of light on each diagram.

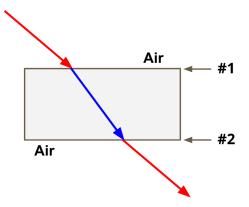## Example Problem 1: Basic Snell's Law Problem

A ray of light in water enters an unknown solid at an angle of 63°. Measure the angle of refraction of the light and determine the index of refraction of the solid.

Example Problem 2: Lab Analysis

The path of laser light from air into, through and out of a rectangular block is shown. ⇒
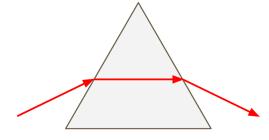Determine the n value of the unknown.

Example Problem 3: Triangular Prism
   The path of laser light from air into, through and out of
   a triangular prism is shown. ⇒
   Determine the n value of the unknown.

Example Problem 4: AnotherTriangular Prism
   The path of laser light from air into, through and out of a
   triangular prism is shown. ⇒
   Determine the n value of the unknown.